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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,435	03/20/2001	Michinobu Nakao	520.39869X00	9519
20457	7590	12/04/2003	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			TU, CHRISTINE TRINH LE	
			ART UNIT	PAPER NUMBER
			2133	3
DATE MAILED: 12/04/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/811,435

Applicant(s)

NAKAO ET AL.

Examiner

Christine T. Tu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 3/20/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 7 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-12 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. Claims 1-5 and 8-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

#### Claim 1:

At lines 9-15, it is not clear whether or not the bit-flipping sequence generator changes the pattern sequence number and time in the pattern sequence due to the recited phrase "a bit-flipping sequence generator which ... changes the positions of bits to be flipped in patterns ..., and pattern sequence number and time in pattern sequence ...".

#### Claim 2:

At line 4, the term in a parenthesis "(seeds)" should be avoid because it is not clear whether or not the term is actually claimed.

At lines 5-6, the term "the pattern sequence clusters (plural)" lacks antecedent basis due to the fact that only a single one cluster is being recited previously (in claim 1).

#### Claim 3:

At line 4, it is not clear in whole of what? In part of what?

At lines 5, 6 and 7, it is not clear what "ones" stand for? Binary "1s"?

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At lines 6 and 8, it is not clear whether the term “pattern” and the term “patterns” refer to the previously recited terms “pattern sequence” or “pattern sequences”, respectively.

Claim 4:

At line 8, it is not clear what “patterns” is being generated. Do these “patterns” refer to any of the previously recited “pseudo-random patterns”? In other words, consistent term should be used throughout the claim(s).

Claim 5:

At lines 2-3, due to the phrase “the test pattern generator as defined in claim 1 or the bit flipping sequence generator....” is recited, it is not clear whether claim 5 is an independent claim or a depend claim which depends on claim 1.

The terms “the bit-flipping sequence generator” at lines 2-3 and “the scan chain” at lines 4-5 lack antecedent basis.

Throughout the claim, it is not clear what interrelationship the semiconductor integrated circuit (at line 1) has with the test pattern generator, the bit-flipping sequence generator and the circuit to be tested.

Claim 8:

At line 17, the use of the pronoun “it” should be avoid. It is not clear what “it” actually refers to.

At line 19, the word “preceding” should be replaced with –third--.

At line 20, the term in a parenthesis “(seeds)” should be avoid because it is not clear whether or not the term is actually claimed.

At line 22, the term "seeds" should be replaced with –initial values—because consistent term should be used throughout the claims.

At line 22, the word "preceding" should be replaced with –fourth--.

Claims 9-10:

Applicant is requested to reformat the claims so as to include the phrase "comprising the steps of" at the end of the preamble and include the "ing" ending words at the beginning of each of the steps to indicate the step thereof.

Claim 9:

The term "such ... as" at line 8 should be avoided because this term leads to the uncertainty of whether or not anything actually occurs.

Claim 10:

At line 6, it is not clear the number of times of what?

At line 7, the term "the unit test sequence length" lacks antecedent basis. It is also not clear when and where the unit test sequence length is being generated.

Claim 11:

At line 17, the use of the pronoun "it" (twice appearances) should be avoid. It is not clear what "it" actually refers to.

Claim 12:

Applicant is requested to reformat the claims so as to include the phrase "comprising the steps of" at the end of the preamble and include the "ing" ending words at the beginning of each of the steps to indicate the step thereof.

At lines 7-8, it is not clear where the resulting pattern actually comes from.

At line 8, it is not clear whether "a test pattern" is part of the previously recited "test patterns" (at lines 2-3).

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipate by Spence et al. (5,258,985 and Spence hereinafter).

Claim 12:

Spence teaches (figures 2 & 3) a BIST circuit (20) comprises a data generator/analyzer (22) for serially shifts the test vectors to be applied to CUT (24). The data generator/analyzer (22) includes cells (cell 1, cell 2, cell 3, cell N) which are configured as an LFSR. Firstly, Logic zero is applied at the second input of the multiplexer (34) to D-input of flipflop (36) of cell 1. After three more clock cycles, logic zero ripples through cells 2-N creating a "0000" test vector is applied to the CUT (24) (figure 3, column 2, lines 33-68; column 4 lines 15-21).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spence et al. (US 5,258,985 and Spence hereinafter).

Claim 4:

Spence discloses the invention substantially as claimed. Spence shows (figures 2& 3) a BIST circuit (20) with combined data generator and data analyzer (22) which is controlled by a controller (26). The controller (26) provides signals for synchronizing and controlling the operation of data generator/analyzer (22). The data generator/analyzer (22) includes serially coupled cells (cell 1, cell 2, cell 3 and cell N) configured as an LFSR. During a test cycle, each of the cells provides a bit of an N-bit test vector. Upon completion of the test cycle, the data generator/analyzer (22) serially

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shifts the resulting test signature through terminal (28) for evaluation against previously calculated valid signature (figures 2 & 3, column 2 lines 34-68, column 3 lines 65-column 4 line 4).

Spence does not explicitly teach the generation of pseudo-random patterns.

Spence, however, teaches that during the test cycle, data generator/analyzer (22) including cells (cell 1, cell 2, cell 3, cell N) for writing random test vectors into locations of the RAM (Circuit under test 24) (column 3 line 65-column 4 line 1).

It would have been obvious to one skilled in the art at the time the invention was made to realize that Spence's random test vectors would have been "pseudo-random patterns". One having ordinary skill in the art would be motivated to realize so because Spence's random test vectors are not excluded from the inclusion of Pseudo-random patterns.

.....

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rajski et al. (US 6,327,687 B1).

Claim 5 (Examiner view claim 5 as independent claim— supra paragraph 1 above):

Rajski discloses the invention substantially as claimed. Rajski shows (figure 2) an integrated circuit (IC) (34) comprises a decompressor (36) and a circuit under test (CUT) (24). The CUT (24) comprises a plurality of scan chains (26) (column 2 line 10-column 3 line 24).



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Rajski does not explicitly show a bit-flipping sequence generator. Rajski, however, teaches a decompressor (36) which comprises a linear finite state machine (LFSM) (52) and a phase shifter (50) for generating test patterns (C0-C7) using Boolean symbolic expression (figure 4) (column 7 line 63-column 8 line 49).

It would have been obvious to one skilled in the art at the time the invention was made to name Rajski's decompressor (36) as a "bit-flipping sequence generator". The artisan would have been motivated to do so because naming Rajski's decompressor (36) as a "bit-flipping sequence generator" would not affect the performance of Rajski's decompressor (36).

8. Claims 1 and 9 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

9. Claims 2-3, 8 and 10-11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. Claims 6-7 are allowable over the prior arts.


11. The Prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine T. Tu whose telephone number is (703) 305-9689. The examiner can normally be reached on Mon-Thur. 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (703)305-9595. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

  
Christine T. Tu  
Primary Examiner  
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